College of Science
Department of Biological Sciences

JORDAN DOWELL

jdowell@lsu.edu

EDUCATION

PhD University of Central Florida, Integrative Biology 2021
Dissertation: Running Title: "Volatile metabolomic dynamics of the annual clade of *Helianthus*"
Advisors: Chase Mason (chair), Pedro Quintana-Ascencio (vice-chair)

MS University of Nevada, Las Vegas, Ecology & Evolutionary Biology 2019
Thesis: "Landscape-scale: inter- and intraspecific variation in plant interactions along a stress gradient in the sheep mountain range of Nevada."
Advisor: Dale Devitt

BS University of Nevada, Las Vegas, Ecology & Evolutionary Biology 2014

GRANTS, HONORS, AND AWARDS

Department of Energy, Systems Biology Research to Advance Bioenergy Crop Production 2025-Present

- Budget TBA (max $15,000,000) standard Grant (under review)
- **Lead PI Dowell, J**; co-pi's Heyduk, K (University of Connecticut) Davis, D (Ohio University)
- Ecosystem Bioenergetic Modeling of Agave Americana and their Microbiomes: Unlocking Insights into Crassulacean Acid Metabolism (CAM) for Bioenergy Advancement.

National Science Foundation Enabling Discoveries through Genomics 2025-Present

- $864,652 standard Grant (under review)
- **Lead PI/Institution**
- Collaborative Research: EDGE CMT: Predicting how biotic and abiotic stress alters selection on an adaptive metabolic pathway.

Searle Scholar Program 2025-Present

- $300,000 standard Grant (under review)

USDA, National Institute of Food and Agriculture: AFRI 2024-Present

- $128,791 standard Grant
- Direct and indirect effects of conserved and lineage-specific volatile organic compounds among eudicots for control of *Botrytis cinerea*

USDA, NIFA: AFRI Postdoctoral Fellowship 2021-2023

- $225,000 external fellowship
- Direct and indirect effects of conserved and lineage-specific volatile organic compounds among eudicots for control of *Botrytis cinerea*

Florida Education Fund Dissertation Fellowship 2020-2021

- $12,000 External Fellowship

Private Funding, Sponsor: Massey services, Inc. 2020-2021

- $140,900 Private funding (Allocation to Dowell: $9,500)
- PI, Swaminathan Rajaraman Co-PI, B. Sharanowski
- Initiative to develop novel nano-sensors for pest management.

University of Washington's Statistical Genetics Summer Institute Scholarship 2020

- $900 External Workshop Scholarship

Bill and Melinda Gates Foundation 2019

- $1,000 External travel award
- Institute for Teaching and Mentoring: Compact for Faculty Diversity

University of Central Florida, Biology Graduate Student Association 2019

- $300 Internal travel award

University of Central Florida, Biology Department 2019

- $250 Internal travel award

Bill and Melinda Gates Foundation Millennium Graduate Fellow 2015-2020

- $175,000 External Fellowship

University of Central Florida's Doctoral Conference Support 2017

- $4,300 Internal Grant

University of Nevada, Las Vegas: Graduate and Professional Society 2016

- $1,000 Internal Research Grant

Bill and Melinda Gates Foundation 2016

- $1,000 External travel award
- Institute for Teaching and Mentoring: Compact for Faculty Diversity

Bill and Melinda Gates Foundation Millennium Undergraduate 2009-2014

- $150,000 External Scholarship

Silver State Millennium Foundation Scholarship 2009-2011

- $2,500 External Scholarship

PUBLICATIONS

Journal Publications (*undergraduate authors)

- **Dowell JA**, Bowsher AW, Jamshad A, Shah R, Burke JM, Donovan LA, Mason CM. Historic breeding practices contribute to germplasm divergence in leaf specialized metabolism and ecophysiology in cultivated sunflower (*Helianthus annuus*). *American Journal of Botany*. **2024** Nov 111(11):e16420.

- **Dowell J**, Mason C. "Candidate pathway and genome-wide association approaches reveal alternative genetic architectures of carotenoid content in cultivated sunflower (Helianthus annuus)." *Appl Plant Sci*. 2023 Dec 2;11(6):e11558. doi:

10.1002/aps3.11558.

- Thomas, G.; Rusman, Q.; Morrison, W.R., III; Magalhães, D.M.; **Dowell, J.A**.; Ngumbi, E.; Osei-Owusu, J.; Kansman, J.; Gaffke, A.; Pagadala Damodaram, K.J.; et al. Deciphering Plant-Insect-Microorganism Signals for Sustainable Crop Production. *Biomolecules* **2023**, *13*, 997. https://doi.org/10.3390/biom13060997

- Bahmani K, *Giguere M, **Dowell J**, Mason C, "Germplasm Diversity of Sunflower Volatile Terpenoid Profiles Across Vegetative and Reproductive Organs." https://doi.org/10.15159/ar.22.084

- Bahmani, K., *A. Robinson, S. Majumder, *A. LaVardera, **J. A. Dowell**, E. W. Goolsby, and C. M. Mason. 2022. Broad diversity in monoterpene–sesquiterpene balance across wild sunflowers: implications of leaf and floral volatiles for biotic interactions. *American Journal of Botany* 109(12): 2051-2067. https://doi.org/10.1002/ajb2.16093

- *Stahlhut, K.N., **Dowell, J.A.,** Temme, A.A., *Burke, J. M., Goolsby, E. W., Mason, C. M., 2021,* "Genetic control of arbuscular mycorrhizal colonization by *Rhizophagus intraradices* in *Helianthus annuus* (L.)." *Mycorrhiza* **31,** 723–734. https://doi.org/10.1007/s00572-021-01050-5

- *De La Pascua, D. R., *Smith-Winterscheidt, C., **Dowell, J. A.**, Goolsby, E. W., and Mason, C. M., 2020, "Evolutionary trade-offs in the chemical defense of floral and fruit tissues across genus *Cornus*," *American Journal of Botany* 107(9): 1260– 1273. https://doi.org/10.1002/ajb2.1540

- **Dowell, J. A.** and Mason, C. M., 2020, "Correlation in plant volatile metabolites: physiochemical properties as a proxy for enzymatic pathways as an alternative biosynthetically informed metric," *Chemoecology*. https://doi.org/10.1007/s00049-020-00322- 4

- **Dowell, J.A.**, *Clark, E.J., *Pliakas, T.P., Mandel J.R., Burke, J.M., Donovan, L.A., and Mason, C.M., 2019, "Genome wide association mapping of floral traits in cultivated sunflower (*Helianthus annuus*)," *Journal of Heredity*, 110:3 275-286 https://doi.org/10.1007/s00049- 020-00322-4

(in-revision & preprints)

- Ridenbaugh, R, **Dowell J**, Goolsby E, Sharanowski., "The effects of plant phytochemistry on parasitoid (Hymenoptera: Braconidae) niche breadth." (submitted to Ecology and Evolution) https://www.authorea.com/doi/full/10.22541/au.165751927.79721255

Selected conference Oral/Poster Presentations

- **Dowell, J. A., "**Energetic investment in pathogen-induced glucosinolates in *Arabidopsis thaliana* varies with pathogen genetic diversity*,"* Botany 2024

- **Dowell, J. A., "**Leveraging hyperspectral reflectance to assess volatile organic compound (VOC) mediated induced responses across the genus *Helianthus,"*

Botany 2023

- **Dowell, J. A., "**Phylogenomic investigation of *Botrytis* metabolic diversification*,"* Botany 2023

- **Dowell, J. A., "**Impacts of *Botrytis cinerea* genetic diversity on the metabolic flux of *Arabidopsis thaliana,"* Bay Area Ecology and Evolution of Infectious Disease 2022

- **Dowell, J. A., "**Isolate specific effects of Botrytis cinerea on the expression of biosynthetic enzymes in *Arabidopsis thaliana,"* Fungal Genetics Society 2022

- **Dowell, J. A.**, "Evolution & diversification of plant-plant communication: An intermediate hypothesis," Plant Biology 2020

- **Dowell, J. A.**, Mason, C. M. "Correlation in plant volatile metabolites: physiochemical properties as a proxy for enzymatic pathways and an alternative metric of biosynthetic constraint", Botany 2020, ABSTRACT ID-576
- **Dowell, J. A.,** and Mason, C. M., "An evolutionarily relevant definition of 'Eavesdropping' and 'Communication," International Society of Chemical Ecology, 2019

- **Dowell, J. A.** and Mason, C. M., "Impacts of physical chemistry on biosynthetic constraints of plant volatile profiles," International Society of Chemical Ecology, 2019

- **Dowell, J.A.,** *Clark, E.J., *Pliakas, T.P., Mandel J.R., Burke, J.M., Donovan, L.A., and Mason, C.M., "Genome-wide association mapping of floral traits in cultivated sunflower (*Helianthus annuus*)," Botany, 2018, ABSTRACT ID-295.

WORKSHOPS AND INVITED LECTURES

- **Lecture,** "Examining the Metabolic Battlefield of Plant-biotic Interactions," Washington St. Louis, Tyson Research Center, 2024.

- **Lecture,** "Growth-defense tradeoffs & multifunctional traits in plant-biotic interactions," University of Connecticut, Ecology and Evolutionary Biology Department, 2024.

- **Lecture,** "Examining the Metabolic Battlefield of Plant-biotic Interactions," University of California Davis, Plant Sciences Department, 2024.

- **Lecture,** "Examining the Metabolic Battlefield of Plant-biotic Interactions," Louisiana State University, Plant Physiology and Plant Pathology Department, 2024.

- **Lecture,** "Growth, defense, and a little offense: Trade-offs in plant pest and pathogen interactions across scales," Louisiana State University, Entomology Department, 2023.

- **Lecture,** "Can you really have it all? Exploring growth defense tradeoffs in plant-pathogen interactions," University of California Davis, Plant Pathology department, Postdoctoral fellow seminar series. 2022.

- **Lecture,** "Leveraging hyperspectral reflectance to assess volatile organic compound (VOC) mediated induced responses across the genus Helianthus," American Chemical Society Fall 2022, Early Career Symposium: Deciphering plant-insect-microorganism signals for sustainable crop protection. 2022.

- **Lecture,** "Evolution & diversification of plant-plant communication: An intermediate hypothesis," Plant Biology 2020, MAC Symposium 3: Evo-Devo 2020: Case Studies in Diversity. 2020

- **Lecture**, "The language of life: chemically mediated interactions in plant ecology & evolution," Niagara University, Early career researcher diversity seminar series, 2019.

- **Workshop**, "Comparative plant metabolomics & Bayesian hierarchal clustering analysis," University of Central Florida, Department of Biology, 2019.

- **Lecture**, "Sassy sages and gossiping goldenrods: recent advances in plant volatile communication," Florida Native Plant Society, Florida Native Plant Month, 2019.

- **Lecture**, "Volatile metabolomics of the annual clade of *Helianthus*," University of Central Florida, Department of Biology, 2019.

- **Workshop**, "Comparative analytical techniques in Plant Metabolomics," University of Central Florida, Department of Biology, 2019.

- **Lecture**, "Sassy sages and gossiping goldenrods: recent advances in plant volatile communication," Florida Native Plant Society, Tarflower Chapter, 2019.

- **Workshop**, "Introduction to Random Forest models," University of Central Florida's Biology Graduate Student Association data science seminar, 2018.

- **Lecture**, "Landscape Scale: inter-and intraspecific variation in plant interactions along a stress gradient in the sheep mountain range," University of Nevada, Las Vegas, Graduate Student Seminar series, 2017.

TEACHING EXPERIENCE

Louisiana State University 2023-present
Assistant Professor, Department of Biological Sciences

- Courses: Introduction to Plant Physiology (Biol 3060) and Chemical Ecology (Biol 7800)

University of Central Florida 2019-2020
Teaching Assistant, Department of Biology

- Advisor: Eric Goolsby

- Plant Genomics & Biochemistry, Ran an original lab during a pandemic of a joint graduate and undergraduate course. This course consisted of 23 total students, all of which produced individual projects integrating publicly available multi-omic data to answer questions concerning plant genomics and biochemistry.

University of Central Florida 2019-2020
Curriculum Development Assistant, Department of Biology
- Advisor: Eric Goolsby
- Plant Genomics & Biochemistry, development of instructional materials and laboratories for a new joint graduate and undergraduate course. Assorted topics include chromatography (liquid, gas, & capillary electrophoresis), mass spectrometry, untargeted & targeted metabolomics, metabolic pathway modeling, and machine learning in metabolomics & genomics.

University of Nevada, Las Vegas 2015-2017
Graduate Teaching Assistant, Department of Biology
- Principles of Modern Biology II Lab, an undergraduate laboratory course averaging 60 students per semester, covering the following topics: organismal biology, ecological/evolutionary patterns, and processes.

Bodies: The Exhibition, Las Vegas, NV 2012-2015
Educational Director
- Development of instructional materials for docents and educational outreach materials for assorted topics, including anatomy, physiology, and new developments in the field of medicine and comparative anatomy. During my tenure at the museum, average foot traffic was ~300-600 people per day, with a docent staff of 15 individuals.

NON-DEGREE SEEKING RESEARCH EXPERIENCE

Postdoctoral Associate, University of California, Davis 2021-2022
Advisor: Daniel Kliebenstein; Leveraging multi-omic network approaches to explore the evolution of specialized metabolism and biotic interactions between *Botrytis cinerea* (a plant fungal pathogen) and 16 eudicots species.

Research Associate, University of Nevada, Reno-Cooperative Extension 2017
Advisor: Tammara Wynne
Development of outreach-focused experiments concerning domesticated *Solanum lycopersicum* production in the Mojave Desert.

Research Associate, University of Nevada, Las Vegas 2017
Advisors: Lorenzo Apodaca and Dale Devitt
Development and implementation of image analysis-based methods of xylem flow dynamics in urban horticulture trees. Implement multidimensional kriging of climate data concerning the ambient effects of photovoltaic power plants on native shrublands.

Restoration Ecology Intern, Great Basin Institute, Nevada, Las Vegas 2015
Advisor: Russell Lee Nasrallah

Improve highly visible and ecologically important state and national park resources by controlling exotic plants, maintaining hiking trails, and providing an educational resource for park visitors. (Great Basin National Park, Lake Mead National Recreation Area, Spring Mountain Ranch State Park, Desert National Wildlife Refuge, and Pahranagat National Wildlife Refuge).

Undergraduate Research Assistant, University of Nevada, Las Vegas 2012-2013
Advisors: Tereza Jezkova and Javier Rodriguez
Elucidation of phylogeographic and population structure in Mona and Virgin Island Boas, *Chilabothrus monensis* (*Epicrates monenesis)*.

PROFESSIONAL SERVICE

Thriving Earth Exchange – Hollygrove-Dixon 2024-present
- Scientific Consultant focused on leveraging bioremediation in urban neighborhoods of New Orleans to ameliorate soil toxicity and heat island effects.

Workshop/Panel Contributions 2023-present
- Queer in STEM: Louisiana State University Department of Biology
- New Faculty Summit: Louisiana State University

Education working group member 2023-present
- *Kbase.us*
- United States Department of Energy funded a working group developing curriculum materials for comparative genomics using a large-scale data science platform.

Demystifying the Academic Job Market Workshop 2024
- Led a discussion group and workshop with 30+ black graduate students and postdoctoral fellows at the University of California, Davis, discussing how to prepare for the academic job market.

Associate Editor 2022-present
- *Applications in Plant Sciences*

One Garden fellow invited lecture series 2022-2024
- Two live seminars:
  - "Do plants have something to say?"
  - Food Futures: Could new plants solve a food crisis?
    - Link: https://onegarden.com/fellow/dr-jordan-dowell
  - 10,000+ viewers per talk across the Americas, Africa, Asia, and Europe

Botanical Society of America's Publications Committee member 2021-2023
- Includes *APPS, Plant Science Bulletin,* and *American Journal of Botany*

Reviewing Editor for *Applications in Plant Sciences (APPS)* 2020-2022

UCF College of Science Visiting Scholars Program 2020-Reocurring
- $32,000 per year Internal funding allocation

- Co-author Ian Will
- Initiative to supply funding to bring in historically underrepresented scholars to give research seminars and supply a mentorship opportunity for historically underrepresented undergraduate and graduate students.

American Society of Plant Biology panel member 2020

- Answered questions concerning graduate school funding and career options for an audience of
  ~100 undergraduate participants.

Consultant for SEE Turtles organization BIPOC scholarship fund 2020-2023

- Supplied guidance on barriers for BIPOC engaging in field programs and developed a funding schema to house and pay students.

Reviewer

- Oikos, Journal of Chemical Ecology, Chemoecology, Plant Cell, American Journal of Botany, Applications in Plant Sciences

Biology Graduate Student Association

- President, University of Central Florida, 2019-2021
- Secretary, University of Central Florida, 2018-2019

UCF's Biology Integrated Orlando Training and Enrichment Camp

- Plant Science Coordinator, 2018
- Developed and taught a weeklong curriculum of plant science-focused experiments on engaging over 30 high school students from the surrounding Orlando metropolitan area in current research techniques, such as genomics and metabolomics.

Botanical Society of America Graduate School Career Panel (UCF Chapter) 2019-2021

- Answered questions concerning graduate school funding and career options for an audience of 50 undergraduate participants.

Plants Beyond Limits Conference

- Graduate Student Coordinator, University of Central Florida, 2017
  - Initiated, organized, and funded the first student-led conference of Plants Beyond Limits at UCF with ~500 attendees, 20 speakers, and 15 submitted posters from graduate students and postdocs.